Global Modeling Initiative

Status Report: GMI Core Team at GSFC

Susan Strahan, Project Manager

Personnel

Status of Models and Simulations

- » Tropospheric Model
- » Aerosol Model
- » Stratospheric Model
- » Strat-Trope Model

New Met Fields

Miscellaneous

Global Modeling Initiative - Core Team Personnel

From the Atmospheric Chemistry & Dynamics Branch

- **Susan Strahan – overall manager**
- **Bryan Duncan – tropospheric expert**
- **Steve Steenrod – stratospheric model, met field processing**
- **Chris Readinger – pre- and post-processing of inputs and outputs**

From the Science Computing Branch

- **Tom Clune – computing manager**
- **Bigyani Das – tropospheric, tracers, and aerosol simulations**
- **Jules Kouatchou – model portability, tutorial, module implementation**
- **Hamid Oloso – Fast JX implementation, kitchen sink**
- **M. Bhat – Newest member, lightning parameterization,…**
- **Dan Bergmann - consulting**

Global Modeling Initiative - Tropospheric Model

A. Version 1

- Contains updated chemistry (GEOS-CHEM)
- Het chem on sulfate aerosols only
- DAO, GISS, and CCM3 full chemistry simulations completed
- 3D diagnostic output available
- ALL transport tracer runs completed for ALL Met Fields:
  CH_3I-like tracer, CO_2, anthro-CO, and bio-CO

B. Version 1.5/2 – being implemented now

- Het chem on all aerosol surfaces
- Aerosol effects on photolysis rates
- Lightning parameterization from Pickering and Allen

Global Modeling Initiative - Tropospheric Model

C. IPCC Simulations – due January, 2005

- Specified inputs for CO, NMVOC, and NOx from anthro sources + biomass burning
- Four scenarios: present day and 3 different 2030 emissions sets
- Version 1 of the GMI Tropospheric Model
- 3 full chemistry simulations: DAO, GISS, and CCM3
- Specified outputs require minor model recoding

Global Modeling Initiative – Aerosol Model

A. Current Version

- Sulfate, sea salt, organic and black carbon, and dust – most were recently updated (October 2004)
- 4x5 resolution
- 3 2-year simulations completed for DAO, CCM3, and GISS
- Tropospheric tracer runs may be useful for analysis

B. Next version

- Microphysical model (Penner/Liu)
- Aerosol/cloud interaction (Nenes)
- 2x2.5 Resolution?

Global Modeling Initiative – Stratospheric Model

A. Higher horizontal resolution

- Tested 2x2.5° version, summer 2004
- Verified transport improvements over 4x5° version

B. 'Hindcast' simulations (1975-2025)

- To reproduce past ozone, added solar cycle, volcanic eruptions, and energetic particles
- Raised lid to 0.015 hPa (better strat circulation)
- Met fields from 2 years of a 50-yr FVGCM integration
- 50-yr 'Warm Arctic' simulation is finished
- Cold Arctic year simulation: 1973-1993, so far.

Global Modeling Initiative – Strat-Trope Combined Model

- Successful compilation and execution of a 1 year simulation (D. Considine and J. Kouatchou)

  It was initialized with a strat-trope run done at LLNL by Connell, but our results show an ozone buildup – we don't have all the bugs worked out yet. This version uses look-up table for photolysis.

- Implementation of Fast-JX (H. Oloso and M. Prather)

  This is a new photolysis calculation for the troposphere and stratosphere. David C. is working with Hamid to evaluate Fast-JX against the stratospheric lookup tables.

Global Modeling Initiative - New Met Fields

A. **New 5-yr FVGCM integration** with everything under the sun saved every 3 hrs. The fields are being processed into 42 level (2^{o}x2.5^{o}) netcdf input files and tested now.

B. **New GEOS-4 assimilated met fields** for the Trace-P period (Jan-Apr 2001). Recently integrated but not yet processed into netcdf.

C. **New GEOS-4 'forecast mode' met fields** for same period. 5-day forecasts are made every 12 hrs from the analyzed fields. Forecasts must be 'merged' to create new GMI input met data sets. *Work in progress.*

D. **EC/Oslo analyses and forecast mode met fields** for the Trace-P period – from Michael. *To be delivered….*

Global Modeling Initiative - Miscellaneous

- Anonymous ftp login to dirac.gsfc.nasa.gov

  All model output available through anonymous ftp on dirac.gsfc.nasa.gov. If you had problems logging on before, try again. We think all problems have been resolved. Cd to directory /pub/gmidata.

- Our web site is gmi.gsfc.nasa.gov

  The GMI model tutorial is now available on the GMI web site as either html or pdf.